BACKFLOW PREVENTION SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

The present application claims the benefit of provisional application serial number 60/445,200 filed 02/06/03, entitled "PROPOSAL FOR BACK-FLOW PREVENTION DEVICES ON FIRE HYDRANTS AND FIRE DEPARTMENT APPARATUS", the contents of which are incorporated herein by this reference and are not admitted to be prior art with respect to the present invention by the mention in this cross-reference section.

BACKGROUND

This invention relates to providing a backflow prevention system for improved protection of municipal water distribution systems. More particularly this invention relates to providing a fire hydrant backflow prevention system.

Usually when firefighters need to supply a fire truck with extra water to fight a fire they connect a supply fire hose from the fire truck to a fire hydrant. However, it is sometimes necessary for fire fighters to obtain water from other water sources. It is not uncommon for firemen to draw water from swimming pools, mucky ponds, irrigation canals, and other unsanitary sources, especially in rural areas. Fire trucks may also draw water from fire hydrants connected to "brown water" and "gray water" reclaimed/non-potable water distribution systems (such as, for example, reclaimed water distribution systems used to irrigate golf courses, etc.). The same fire truck may then later connect to a fire hydrant of a potable water distribution system. Although water pressure from such a potable water distribution usually keeps contamination from entering the potable water distribution system, sometimes backflow conditions can occur which can result in contaminated water entering the potable water distribution system from the supply fire hose and fire truck water tank.

Further, fire fighters often add foaming agents and other chemicals to the water in the fire truck to assist in fighting fires. These chemicals can also contaminate potable water systems if backflow conditions occur when a fire truck is connected to a fire hydrant of a potable water distribution system.

Typically fire engine tanks are not disinfected before being attached to potable water distribution systems. If contaminated water backflows from a fire hose into a potable water system people drinking water from the system could suffer adverse effects from the health hazard of the contaminated water.

Even further, fire fighters aren't the only ones that draw water from fire hydrants potentially contaminating potable water distribution systems via backflow at fire hydrants. Others

draw water from fire hydrants for a variety of uses (such as, for example, construction). Most municipalities usually require that commercial users drawing water from fire hydrants use a portable backflow prevention device; however not everyone complies with these requirements. In fact, it is not uncommon for people to illegally connect to fire hydrants to steal water from the potable water distribution system, and these people are unlikely to use a backflow prevention device. Such users drawing water from fire hydrants run the risk of introducing contaminants to the potable water distribution system.

OBJECTS AND FEATURES OF THE INVENTION

A primary object and feature of the present invention is to provide a backflow prevention system that helps solve the above problems and helps reduce the above risks of contamination from backflow.

It is a further object and feature of the present invention to provide such a backflow prevention system that helps prevent contamination of potable water distribution systems from backflow at fire hydrant connections.

A further primary object and feature of the present invention is to provide such a system that is efficient, inexpensive, and handy. Other objects and features of this invention will become apparent with reference to the following descriptions.

SUMMARY OF THE INVENTION

In accordance with a preferred embodiment hereof, this invention provides a fire hydrant system, relating to protecting the purity of potable water systems from contamination from frangible-barrel-fire-hydrant use, comprising, in combination: at least one frangible barrel fire hydrant comprising at least one upper barrel body at least one lower barrel body, at least one frangible plane between such at least one upper barrel body and such at least one lower barrel body, at least one water outlet chamber, extending from such at least one upper barrel body, and at least one water entry into such at least one water outlet chamber from such at least one upper barrel body; wherein such at least one upper barrel body and such at least one water outlet chamber together comprise exactly one unitary-construction housing; at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber; and at least one backflow preventer situate within such exactly one unitary-construction housing; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry. Moreover, it provides such a fire hydrant system wherein such at least one backflow preventer comprises at least one valve disc. Additionally, it provides such a fire hydrant system wherein such at least one valve

disc of such at least one backflow preventer, when closed, is located adjacent such at least one water entry. Also, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least one fire hose-connectable water outlet. In addition, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least two fire hose-connectable water outlets. And, it provides such a fire hydrant system wherein such at least two hose-connectable water outlets comprise water outlets adapted to at least two different hose diameters. Further, it provides such a fire hydrant system wherein such at least one backflow preventer is located adjacent such at least one water entry. A fire hydrant system, relating to protecting the purity of potable water systems from contamination from frangible-barrel-fire-hydrant use, comprising, in combination: at least one frangible barrel fire hydrant comprising at least one upper barrel body at least one lower barrel body, at least one frangible plane between such at least one upper barrel body and such at least one lower barrel body, at least one water outlet chamber, extending from such at least one upper barrel body, and at least one water entry into such at least one water outlet chamber from such at least one upper barrel body; at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber; and at least one backflow preventer; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry; and wherein such at least one backflow preventer is located substantially adjacent such at least one water entry. Even further, it provides such a fire hydrant system wherein such at least one backflow preventer comprises at least one valve disc. Moreover, it provides such a fire hydrant system wherein such at least one valve disc of such at least one backflow preventer, when closed, is located adjacent such at least one water entry. Additionally, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least one fire hose-connectable water outlet. Also, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least two fire hose-connectable water outlets. In addition, it provides such a fire hydrant system wherein such at least fire two hose-connectable water outlets comprise water outlets adapted to at least two different fire hose diameters.

In accordance with another preferred embodiment hereof, this invention provides a fire hydrant system, relating to protecting the purity of potable water systems from contamination from use of at least one frangible barrel fire hydrant having at least one upper barrel body, at least one lower barrel body, and at least one frangible plane between the at least one upper barrel body and the at least one lower barrel body, such fire hydrant system comprising, in combination: the at least

one upper barrel body; at least one water outlet chamber, extending from such at least one upper barrel body, and at least one water entry into such at least one water outlet chamber from such at least one upper barrel body; wherein such at least one upper barrel body and such at least one water outlet chamber together comprise exactly one unitary-construction housing; at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber; and at least one backflow preventer situate within such exactly one unitary-construction housing; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry. And, it provides such a fire hydrant system wherein such at least one backflow preventer comprises at least one valve disc. Further, it provides such a fire hydrant system wherein such at least one valve disc of such at least one backflow preventer, when closed, is located adjacent such at least one water entry. Even further, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least one fire hose-connectable water outlet. Moreover, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least two fire hose-connectable water outlets. Additionally, it provides such a fire hydrant system wherein such at least two fire hose-connectable water outlets comprise water outlets adapted to at least two different fire hose diameters. Also, it provides such a fire hydrant system wherein such at least one backflow preventer is located adjacent such at least one water entry.

In accordance with another preferred embodiment hereof, this invention provides a fire hydrant system, relating to protecting the purity of potable water systems from contamination from use of at least one frangible barrel fire hydrant having at least one upper barrel body, at least one lower barrel body, and at least one frangible plane between the at least one upper barrel body and the at least one lower barrel body, such fire hydrant system comprising, in combination: the at least one upper barrel body; at least one water outlet chamber, extending from such at least one upper barrel body, and at least one water entry into such at least one water outlet chamber from such at least one upper barrel body; wherein such at least one upper barrel body and such at least one water outlet chamber together comprise exactly one unitary-construction housing; at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber; and at least one backflow preventer situate within such exactly one unitary-construction housing; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry. In addition, it provides such a fire hydrant system wherein such at least one backflow preventer comprises at least one valve disc. And, it provides such a fire hydrant system wherein

such at least one valve disc of such at least one backflow preventer, when closed, is located adjacent such at least one water entry. Further, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least one fire hose-connectable water outlet. Even further, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least two fire hose-connectable water outlets. Moreover, it provides such a fire hydrant system wherein such at least two fire hose-connectable water outlets comprise water outlets adapted to at least two different fire hose diameters. Additionally, it provides such a fire hydrant system wherein such at least one backflow preventer is located adjacent such at least one water entry.

In accordance with another preferred embodiment hereof, this invention provides a fire hydrant system, relating to protecting the purity of potable water systems from contamination from use of at least one frangible barrel fire hydrant having at least one upper barrel body, at least one lower barrel body, and at least one frangible plane between the at least one upper barrel body and the at least one lower barrel body, such fire hydrant system comprising, in combination: the at least one upper barrel body; at least one water outlet chamber, extending from such at least one upper barrel body, and at least one water entry into such at least one water outlet chamber from such at least one upper barrel body; wherein such at least one upper barrel body and such at least one water outlet chamber together comprise at least one upper barrel structure; at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber; and at least one backflow preventer situate within such at least one upper barrel structure; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry. Also, it provides such a fire hydrant system wherein such at least one backflow preventer comprises at least one valve disc. In addition, it provides such a fire hydrant system wherein such at least one valve disc of such at least one backflow preventer, when closed, is located adjacent such at least one water entry. And, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least one fire hose-connectable water outlet. Further, it provides such a fire hydrant system wherein such at least one water outlet chamber comprises at least two fire hose-connectable water outlets. Even further, it provides such a fire hydrant system wherein such at least two fire hose-connectable water outlets comprise water outlets adapted to at least two different fire hose diameters. Even further, it provides such a fire hydrant system wherein such at least one backflow preventer is located adjacent such at least one water entry.

In accordance with another preferred embodiment hereof, this invention provides at least

one method, relating to protecting the purity of potable water systems from contamination from use of at least one frangible barrel fire hydrant having at least one upper barrel body, at least one lower barrel body, and at least one frangible plane between the at least one upper barrel body and the at least one lower barrel body, such at least one method comprising, in combination, the steps of: providing for identification of needs of at least one community potable-water system desiring fire-hydrant backflow-prevention protection; providing for manufacture of at least one upper barrel structure comprising at least one upper barrel body; at least one water outlet chamber, extending from such at least one upper barrel body, at least one water entry into such at least one water outlet chamber from such at least one upper barrel body, at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber, and at least one backflow preventer situate within such at least one upper barrel structure; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry; and providing for delivery of such at least one upper barrel structure, installable on the at least one lower barrel body, to such at least one community potable-water system. Even further, it provides such a method further comprising the step of installing such at least one upper barrel structure within such at least one community potable-water system.

In accordance with another preferred embodiment hereof, this invention provides a fire hose system relating to a fire hydrant system, relating to protecting the purity of potable water systems from contamination from fire hoses used with fire hydrants, comprising, in combination: at least one water conduit having at least one water entry site and at least one water exit site; wherein such at least one water entry site is adapted to be connected with at least one fire hydrant water exit; and wherein such at least one water exit site is adapted to be connected with at least one fire-fighting hose; and at least one backflow preventer located within such at least one water conduit; wherein such at least one backflow preventer comprises exactly one check valve.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of a fire hydrant backflow prevention system according to a preferred embodiment of the present invention.

FIG. 2 shows a sectional view through section 2-2 of the fire hydrant backflow prevention system of FIG. 1.

FIG. 3 shows a sectional view through section 3-3 of the fire hydrant backflow prevention system of FIG. 1.

FIG. 4 shows a cutaway view of a fire hose backflow prevention system according to an

alternate preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE BEST MODE AND PREFERRED EMBODIMENTS OF THE INVENTION

FIG. 1 shows a perspective view of fire hydrant backflow prevention system **100** according to a preferred embodiment of the present invention. Preferably, backflow prevention system **100** comprises barrel fire hydrant **102**, as shown. Preferably, barrel fire hydrant **102** is a "dry barrel" fire hydrant, as shown. Preferably, barrel fire hydrant **102** comprises barrel body **104**, as shown. Preferably, barrel fire hydrant **102** comprises outlet chamber **106** extending from barrel body **104**, as shown. Preferably outlet chamber **106** (at least embodying herein at least one water outlet chamber, extending from said at least one upper barrel body) comprises discharge nozzle **108**. Preferably discharge nozzle **108** (at least embodying herein wherein said at least one water outlet chamber comprises at least one fire hose-connectable water outlet) is adapted to connect to standard fire hoses. Preferably discharge nozzle **108** comprises removable nozzle cap **109** which helps prevent debris and other material from entering outlet chamber **106** through discharge nozzle **108** when discharge nozzle **108** is not being used. Preferably outlet chamber comprises at least one additional discharge nozzle **110** (at least embodying herein wherein said at least one water outlet chamber comprises at least two fire hose-connectable water outlets). Preferably, barrel fire hydrant **102** comprises one outlet chamber **106** with one main discharge nozzle **108** at the end and smaller additional nozzles **110** on the side, as shown (see FIG. 3). Preferably, main discharge nozzle **108** is about 4-1/2 inches in diameter. Preferably, additional discharge nozzle **110** is about 2-1/2 inches in diameter (at least embodying herein wherein said at least two hose-connectable water outlets comprise water outlets adapted to at least two different hose diameters). Preferably, barrel cavity **122** is about six inches in diameter. Preferably, outlet chamber **106** is about 5-1/2 inches in diameter. Preferably discharge nozzle **110** comprises NST (National Standard Thread) threads or a "Storz" quick-connection to fit standard fire hoses. Preferably, outlet chamber **106** is integrally connected to barrel body **104**. Preferably outlet chamber **106** and barrel body **104** comprise a unitary-construction housing (at least embodying herein wherein said at least one upper barrel body and said at least one water outlet chamber together comprise exactly one unitary-construction housing), as shown. Preferably, outlet chamber **106** and barrel body **104** are cast together and/or welded permanently together. Upon reading the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, etc., other fire hydrant arrangements may suffice, such as, for example, wet-barrel fire hydrants, other types of fire hydrants, other types

of barrel bodies, other outlet arrangements, alternate discharge nozzle sizes and arrangements, alternate discharge nozzle threading arrangements, etc.

FIG. 2 shows a sectional view through section 2-2 of the fire hydrant backflow prevention system of FIG. 1. Preferably barrel body **104** comprises barrel cavity **122**, as shown. Preferably, barrel fire hydrant **102** comprises shut-off valve **116**. Preferably shut-off valve **116** comprises shaft **114** and valve nut **112**, for operating shut-off valve **116**, as shown. Preferably, shut-off valve **116** is normally closed, and barrel cavity **122** is dry. Upon reading the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, etc., other shut-off valve arrangements may suffice, such as, for example, a shut-off valve for each outlet chamber **106** rather than shut-off valve for barrel cavity **122** (such as, for example, if used with a wet barrel fire hydrant, etc.), other types of shut-off valve, etc. Preferably, outlet chamber **106** comprises backflow prevention device **118** (at least embodying herein at least one backflow preventer situate within said exactly one unitary-construction housing). Preferably, backflow prevention device **118** comprises check valve **119**, as shown. Preferably, to obtain water, a user operates shut-off valve by turning valve nut **112** which is connected to shut-off valve by shaft **114**. Preferably, opening shut-off valve **116** allows pressurized water from potable water distribution system **300** (such as, for example, a municipal water main) to enter barrel cavity **122**. Preferably, pressurized water in barrel cavity opens backflow prevention device **118**, enters outlet chamber **106** through chamber entry **124** (at least embodying herein at least one water entry into said at least one water outlet chamber from said at least one upper barrel body), and then exits through discharge nozzle **108** or discharge nozzle **110** as indicated by water flow channel **126** (at least embodying herein at least one water-flowable channel extending from within said at least one upper barrel body, through said at least one water entry, and through said at least one water outlet chamber), as shown. Preferably, check valve **119** is located in outlet chamber **106** adjacent to barrel body **104** at chamber entry **124** (at least embodying herein wherein said at least one backflow preventer is located adjacent said at least one water entry), as shown.

Preferably, check valve **119** (at least embodying herein wherein said at least one backflow preventer is adapted to assist prevention of backflow of water through said at least one entry) allows water from barrel cavity **122** to enter outlet chamber **106**, and helps prevent water in outlet chamber **106** from entering barrel cavity **122**. Preferably, check valve **119** is structured and arranged to minimize head loss of water passing through check valve **119**. Preferably, check valve **119** is structured and arranged so that the water pressure in barrel cavity needs to be at least slightly

greater [preferably about 1/2 pounds-per-square-inch ("psi") to about 3 psi] than the water pressure in chamber **106** to keep check valve **119** open. Preferably, check valve **119** is structured and arranged so that when water pressure in chamber **106** exceeds, or is equal to, the water pressure in barrel cavity **122**, check valve **119** closes. Preferably, check valve **119** comprises valve disc **125** (at least embodying herein wherein said at least one backflow preventer comprises at least one valve disc). Preferably, check valve **119** comprises an internally loaded plunger-type valve that can tightly seal against a machined valve seat of chamber entry **124** (at least embodying herein wherein said at least one valve disc of said at least one backflow preventer, when closed, is located adjacent said at least one water entry), as shown. Preferably, valve disc **125** is about four inches in diameter. Preferably, valve disc **125** is made of Lexan to help prevent calcium build-up. Preferably valve disc **125** has a ½-inch overlap around chamber entry **124** and abuts rubber gasket **123** (adjacent barrel body **104**) when closed, as shown. Upon reading the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, valve maintenance and reliability, valve head loss, etc., other backflow prevention device arrangements may suffice, such as, for example, other types of check valves, multiple check valves, backflow prevention devices other than check valves, locating backflow prevention device inside barrel body, etc.

Preferably, backflow prevention device **118** comprises relief valve **120**, as shown. Preferably, relief valve **120** comprises relief valve outlet **121**, as shown. Preferably relief valve **120** helps prevent water pressure in outlet chamber **106** from exceeding water pressure in barrel cavity **122**. Preferably, relief valve **120** allows water in outlet chamber **106** to exit through relief valve outlet **121** when check valve is closed. Preferably, relief valve **120** helps reduce the risk of seepage backflow around disc when check valve **119** is closed. Preferably, relief valve **120** is normally open. Preferably, relief valve **120** closes when check valve **119** is open and water pressure in chamber is greater than about eight psi. Preferably relief valve **120** comprises a 1-1/2-inch valve that operates on a reduced pressure method. Upon reading the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, valve maintenance and reliability, valve head loss, etc., other relief valve arrangements may suffice, such as, for example, other types of relief valves, multiple relief valves, relief valves that operate in a different manner, not having a relief valve, etc.

Preferably, barrel fire hydrant **102** is connected to potable water distribution system **300**, as shown. Preferably, barrel fire hydrant **102** (at least embodying herein at least one upper barrel

body) comprises frangible connection **150** (at least embodying herein at least one frangible plane between said at least one upper barrel body and said at least one lower barrel body), as shown, so that barrel fire hydrant **102** can break away (such as, for example, if barrel fire hydrant is hit by a car) from lower barrel body **300** (also called a standpipe). Preferably lower barrel body **300** is connected to a pressurized potable water distribution system. Preferably, frangible connection **150** fits standard barrel fire hydrant frangible connections so that barrel fire hydrant **102** can replace existing hydrants. Preferably, to help prevent backflow contamination of potable water distribution systems, municipalities replace old fire hydrants (that aren't equipped with backflow prevention) with barrel fire hydrant **102** by attaching barrel fire hydrant **102** to the lower barrel body of the old fire hydrant.

Preferably, a vendor identifies the needs of communities that would benefit from fire hydrant backflow prevention (such as, for example, from budgetary constraints, existing fire hydrants sizes and specifications, etc.). Preferably, vendor provides backflow prevention fire hydrant **102** adapted to replace existing fire hydrants in the community (for example, to fit existing lower barrel bodies of old fire hydrants and with nozzles of the appropriate size and threading type for the community, etc.), and for new installations. Preferably backflow prevention fire hydrants **102** replace existing fire hydrants according to a schedule consistent with the needs of the community (such as, for example, phased replacement scheduled over a period of time). Thus, it is noted that in accordance with another preferred embodiment hereof, this invention provides at least one method, relating to protecting the purity of potable water systems from contamination from use of at least one frangible barrel fire hydrant having at least one upper barrel body, at least one lower barrel body, and at least one frangible plane between the at least one upper barrel body and the at least one lower barrel body, such at least one method comprising, in combination, the steps of: providing for identification of needs of at least one community potable-water system desiring fire-hydrant backflow-prevention protection; providing for manufacture of at least one upper barrel structure comprising at least one upper barrel body; at least one water outlet chamber, extending from such at least one upper barrel body, at least one water entry into such at least one water outlet chamber from such at least one upper barrel body, at least one water-flowable channel extending from within such at least one upper barrel body, through such at least one water entry, and through such at least one water outlet chamber, and at least one backflow preventer situate within such at least one upper barrel structure; wherein such at least one backflow preventer is adapted to assist prevention of backflow of water through such at least one entry; and providing for delivery of such at least one upper barrel structure, installable on the at least one lower barrel body, to such at least

one community potable-water system. Even further, it provides such a method further comprising the step of installing such at least one upper barrel structure within such at least one community potable-water system.

FIG. 3 shows a sectional view through section 3-3 of the fire hydrant backflow prevention system of FIG. 1. Preferably, one outlet chamber **106** with one backflow prevention device **118** are arranged to serve one discharge nozzle and at least one additional discharge nozzle **110**, as shown.

FIG. 4 shows a cutaway view of a fire hose backflow prevention system according to an alternate preferred embodiment of the present invention. Preferably, backflow prevention system **100a** comprises chamber **106a**, as shown. Preferably, chamber **106a**, comprises backflow prevention device **118a** (at least embodying herein at least one backflow preventer located within said at least one water conduit), as shown. Preferably, backflow prevention device **118a** comprises check valve **119a** (analogous to check valve **119** described above), as shown. Preferably, backflow prevention device **118a** comprises relief valve **120a** (analogous to check valve **120** described above), as shown. Preferably, backflow prevention device **118a** comprises no more than one check valve **119a** (at least embodying herein wherein said at least one backflow preventer comprises exactly one check valve) to keep size and weight, etc., manageable. Upon reading the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, valve maintenance and reliability, valve head loss, etc., other backflow prevention device arrangements may suffice, such as, for example, other types of check valves, multiple check valves, backflow prevention devices other than check valves, etc.

Preferably, backflow prevention system **100a** comprises connector **130** adapted to connect to fire hose **132** (at least embodying herein wherein said at least one water exit site is adapted to be connected with at least one fire-fighting hose), as shown. Preferably connector **130** comprises NST threads or a "Storz" quick-connection so that a fire hose can be attached to the discharge nozzle of chamber **106a**, as shown. Preferably, fire fighters leave backflow prevention system **100a** permanently attached to fire hose **132**, as shown. Preferably, backflow prevention system **100a** is only removed from fire hose **132** when repairs or replacement of fire hose **132** and/or backflow prevention system **100a** are necessary. Preferably, backflow prevention system **100a** comprises attacher **128** adapted to attach to a fire hydrant **202** (at least embodying herein wherein said at least one water entry site is adapted to be connected with at least one fire hydrant water exit), as shown. Preferably attacher **128** comprises swivel collar with lugs, as shown, to attach to NST threads or a "Storz" quick-connection of a discharge nozzle **204** of a fire hydrant **202**, as shown. Upon reading

the teachings of this specification, those with ordinary skill in the art will now understand that, under appropriate circumstances, considering issues such as intended use, production cost, fire codes and regulations, types of fire hydrants, etc., other connector and attacher arrangements may suffice, such as, for example, different types of connectors, different types of threading, having backflow prevention system **100a** integrally connected to fire hose **132**, etc.

Although applicant has described applicant's preferred embodiments of this invention, it will be understood that the broadest scope of this invention includes such modifications as diverse shapes and sizes and materials. Such scope is limited only by the below claims as read in connection with the above specification.

Further, many other advantages of applicant's invention will be apparent to those skilled in the art from the above descriptions and the below claims.